

GENERATING HYPOTHESES

For this exercise, students are given quantitative data/rates in table or graph form that display differences between groups (by nationality, income, race/ethnicity, etc.). They are asked to do the following:

1. read/interpret the table/graph
2. explain conceptually how the rates in the table/graph were calculated (this involves application of previous exercises calculating rates and allows us to assess students' comprehension and retention of this material)
3. generate 2 or 3 hypotheses that can explain the observed differences between groups
4. indicate the type of data needed to evaluate at least one of the above hypotheses
5. discuss what the data would look like if the hypothesis were supported/not supported
6. make one suggestion on how to reduce differences between groups assuming that their hypothesis were supported.

Example:

Students are given a graph that displays child mortality rates (CMR) for different regions of the world for 2004 from the U.N. Millennium Development Goals Report 2007.

1. Students are asked to interpret the graph, finding that child mortality rates are higher for some regions than for others.
2. Students explain that to arrive at a child mortality rate of 168 per 1,000 for the Sub-Saharan Africa, researchers took the number of deaths of children under five in that region in 2004 divided by the total number of children under five in mid-2004 multiplied by 1,000. Similarly, to arrive at the infant mortality rate of 37 per 1,000 for Northern Africa in 2004, they took the number of deaths of children under five in that region in 2004 divided by the total number of children under five in mid-2004 multiplied by 1,000. (Students don't need the actual number of child deaths to do this but can just be reminded that this is how we calculated mortality rates earlier in the quarter.)
3. Students hypothesize that income is related to CMR, with higher income regions having lower CMRs than lower income regions. They further hypothesize that number of hospitals in the region and access to clean water are inversely related to CMRs.
4. Choosing the first hypothesis, students say that they need data on income or wealth for each region. We will have compiled data on Gross National Income (GNI) for the different regions and give them to students as a handout. Alternatively, we could use the table at http://siteresources.worldbank.org/DATASTATISTICS/Resources/eap_wdi.pdf which contains additional information and would give students further practice in reading tables and extracting needed information. Students then construct a scatter plot that displays CMR and GNI jointly. (This would again be an opportunity to assess how well earlier learning was retained.)
5. Students should expect a negative relationship between GNI and CMR if their hypothesis is supported and no relationship or a positive relationship if it were not supported.
6. Students might suggest increasing income-generating opportunities for low-income countries.